1st EPS TIG Hands-on Event for Science, Technology and Interfaces

- ✓ Science
- ✓ Technology
- ✓ Applications

- ✓ **Need:** Know-how

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1st EPS TIG Event
for Science, Technology and Interfaces

> What:
Offering young physicists and engineers new hands-on skills in hardware, software and related interfaces.

> When:
October 4th-6th, 2019.

> Where:
IdeaSquare, CERN. Geneve, Switzerland.

> How:
Limited participation through application. Subscription period: June 1st – September 4th.

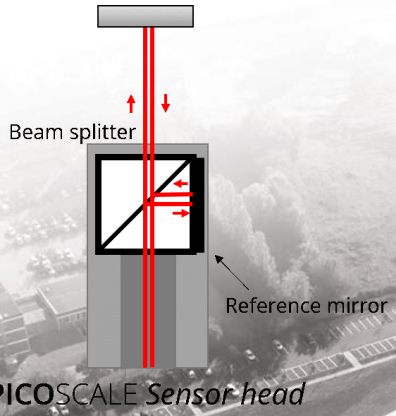
> Info:
https://indico.cern.ch/event/788273/registrations/48124/

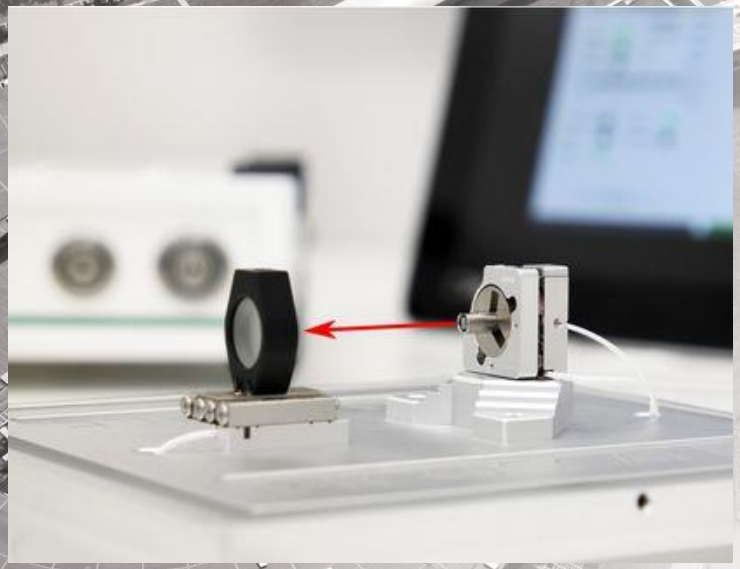
> Organizer:
European Physical Society Technology and Innovation Group

Know-how

- ✓ How to interface modern scientific instrumentation ?
- ✓ How to proceed in a laboratoty context (project) ?
- ✓ Where are the limiting factors ?

Experiment proposal 1: Picoscale Fiber based interferometer and piezo-technology



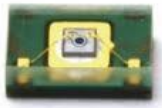


1. Set up a modern interferometer (hard and software)
2. Make up a 3 axis piezo stack including supply cables
3. Install a mirror on it
4. Elaborate a simple power supply scheme to move 2 axes
5. Exploit the Picoscale integrated feedback-feature (FPGA based) to stabilise 1 of the axes

WHY ?

You learn about latest metrology technology and nanometer-scale positioning, employed in an increasing number of instruments, such as local probes, high-precision optics, etc.

Experiment proposal 2: APD-diode based detection chain

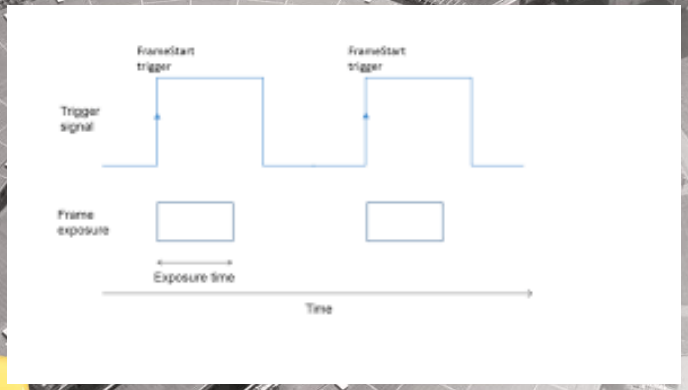


1. Set up an APD-based detection chain from detector to digital scope
2. Make up a pulsed optical emitter from a LED
3. Measure pulse delay
4. Analyse and estimate overall behaviour and limits (time resolution and sensitivity) of the detector chain

WHY ?

You learn about the principal concept of analog detectors and how they are used. Numerous applications from car industry to space are actually prevailing.

Experiment proposal 3: CCD Camera: fast microscope with timestamped images, employing internal FPGA

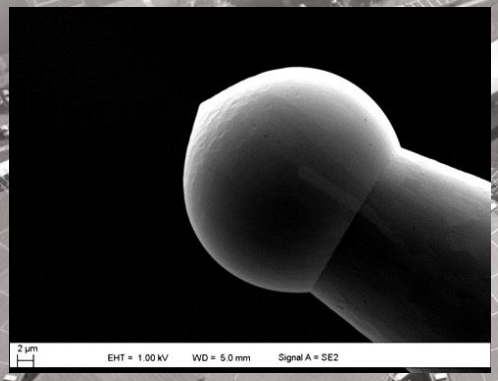


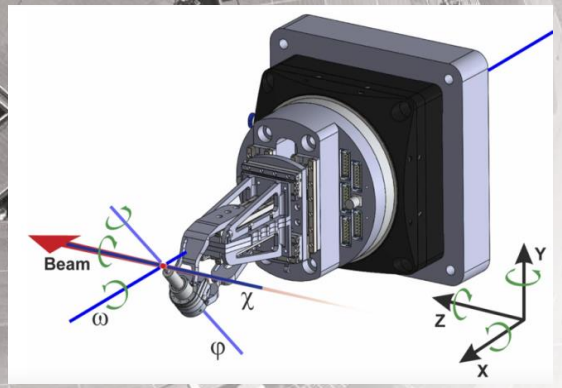
1. Set up a CCD-Camera with a PC USB connection
2. Explore the functionalities in terms of speed and timestamped, triggered recording
3. Make a simple and ultracompact fast microscope with 1µm resolution.
4. Analyse and performance and spot limitations

WHY ?

You learn about actually available camera technology and how to quickly exploit them for rapid observation of « small » experimental situations.

Experiment proposal X: We have spare Ideas²





1. Set up an ultracompact optical spectrometer
2. Explore its working principle (!) that differs from the usual ones.
3. Make a some measurements, potentiall in combination with Experiments 1 -3

WHY ?

You learn about newest compact spectrometer technology and how to apply it (fiberoptics, µ-fluidics).

1. How make a low-cost microfiducial that turns out to be quite useful even for nano-scale-science ? -> Listen to Antoine !